

Safety, Maintenance and Organisational Hazards

INTRODUCTION

All industries have different type of tools, equipment and machinery. There is always a risk of hazard while operating machines. They may be physical, biological, psychological, electrical, etc. It is crucial for all employees to be aware of the risk of hazards associated with the industry they work in. While handling tools and machines, employees should follow safety instructions. Specialised training must be given to the employees to prevent injuries from these hazards.

Employees should take precautions to guard against work related hazards and accidents. They should also be explained the importance of cleaning, and maintenance of machinery at their workplace. This includes regularly checking the tools, equipment, machinery, furniture, infrastructure and facilities of the workplace to ensure they are in good working condition and can give the best operating efficiency.

SESSION 1: ORGANISATIONAL HAZARDS AND SAFETY MEASURES

Most manufacturing units have similar hazards in their processes and work areas. Hence, it is mandatory to have adequate equipment and facilities in the factory to

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avoid these hazards. Adequate planning, training and awareness workshops are necessary to train employees and workers, in which, the employees must be made aware of various hazards associated with its units, such as embroidery, and the precautions to be taken. Even though manufacturing units like the garment manufacturing is an organised sector in India, they usually fail to adhere to all standards and rules set down by the government. Many small units are located in residential areas which may be prone to fire and other hazards.

All the manufacturing units, whether located in a commercial or residential area, must follow compliance and should have the necessary equipment, like fire extinguishers, hydrants, emergency exits, emergency lights, hooters, first aids, etc. Workers may suffer many occupational accidents due to the processes and equipment or machines used in the garment industry. It is the prime responsibility of an organisation to provide occupational health and safety conditions to the workers.

Types of hazards

There is always a threat of hazards and risks to the health and safety of people at workplace. These may be chemical hazards, physical hazards, adverse ergonomic conditions, allergies, psychological risks, etc.

Physical hazards

They often affect many workers in the workplace, for example occupational hearing loss, postural defects, falls, accidents, etc. Hearing loss is one of the most common problems in a manufacturing unit with heavy noise-making machines like the sewing machine or a cutter; postural defects like cervical and bone shape change can occur if a person needs to sit or stand in a particular position all the time like an *addawala* needs to work sitting on the floor with her head bent down most of the time. Accidents and falls are also a common cause of occupational injuries and deaths in industries, like transportation, construction, extraction, healthcare, building, cleaning and maintenance.

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Some of the problems associated with the physical environment at an embroidery workplace include:

- (a) chest infection, allergies, flu, etc., caused due to excessive dust. Adequate ventilation, exhaust fans, etc. are helpful to make the environment clean and dust-free.
- (b) a low light environment for working, and shortage of eye protective glasses, which can cause eye problems.
- (c) prolonged sitting, and continuous needle work involving the eye, creates eye problems (strained eyes) and back bone problems for the embroidery workers. Repetitive Strain Injury (RSI) is likely to occur at an embroidery workplace due to long hours of sitting to complete the embroidery work. Problems like backache, stiffening of neck, cervical and wrist joint problems can also occur during embroidery. These problems can be solved with the following tips:

- (i) Use a hoop stand, embroidery frame or *adda* to keep both of the hands free to focus.
- (ii) Keep the stand on a height till bust level and straight wrist position to avoid bending your neck and back for long time.
- (iii) Use wrist rests to avoid strain in the hand and wrist joint.
- (iv) Take short breaks from long sittings, may be after an hour or two, to relax the strain in the back.

Some other common problems associated with surroundings in an embroidery unit are listed below:

- (d) absence of enough congenial and hygienic working atmosphere in the industry
- (e) prevalence of sexual harassment
- (f) absence of enough toilets and washrooms
- (g) lack of clean and filtered drinking water. Also, the absence of clean water for washing hands for the workers
- (h) discrimination in wages and other facilities between male and female workers
- (i) absence of weekly holiday for female workers. If they still take a leave, then it is without pay
- (j) lack of recreation facilities for workers and
- (k) absence of baby care centres for workers.





Fig. 5.1(a,b) Fire extinguishers

Fire hazards

They are common in those industries that use a lot of flammable material, like cotton, chemicals, etc. Fire hazards occur mainly due to the following reasons:

- improper working of fire and smoke alarm bells in industries
- absence of fire and smoke alarm systems in many industries
- improper maintenance of fire exits or emergency staircase
- lack of proper exit route or emergency staircase to reach the place of safety

Every industry should keep fire extinguishers as a safety measure.

Biological hazards

These involve contagious bacteria, viruses and toxins. It can be due to non-airy and dark rooms, suffocation (bad ventilation), and unhygienic conditions of washrooms. For example, influenza affects a broad population of workers. Outdoor workers, like farmers, gardeners and civil or building workers have a high risk of infection due to biological hazards. These also include animal bites and stings, problems from toxic plants, and transmitted diseases through animals.

Healthcare workers, veterinary health workers face high risk coverage to blood-borne pathogens and various infectious diseases in comparison to others. Dangerous chemicals can cause a hazard in the work area. There are many categories of hazardous chemicals.

Certain chemicals are harmful at some levels when mixed with other chemicals. Chemical hazards are very common in apparel and textile industry while at the time of dyeing and printing.

Psycho-social hazards

This means that the status of mental health and emotional well-being of the workers and employees in an organisation may not be normal. These could be due to a feeling of job insecurity, long working hours, lack of enthusiasm towards work, frustration about not being allowed to deliver quality product due to pressure of quantitative production, harassment at work place and poor work-life balance due to lack of appreciation. This aspect should be dealt with care, as these are sensitive issues. This review also demonstrated that behavioural therapy, like continuous counselling, meditation, yoga, participation in recreation centres, music therapy or occupational care are effective in reducing sick leave days and poor work efficiency at the workplace.

Electrical hazards

These are common in the textile industry as fabrics, machines and other fire-prone equipment are being dealt with here. It is quite dangerous when a worker or employee creates an electrical contact with keyed up equipment or a conductor. Electrical accidents mostly occur when the individuals are working around electrical apparatus which is live but they think it is dead. Wrong use of equipment and use of faulty electrical equipment also cause accidents. Working on, or near electric equipment, without adequate training or appropriate equipment, may be one of the reasons.

Shocks from faulty equipment can lead to brutal and permanent injuries. Due to serious injuries, the chances to fall off from ladders or other work platforms, are high. Apart from injuries or accidents, such mistakes or avoidance lead to damage of the plant, machines, equipment and property.

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In a hand embroidery unit, all the hazards mentioned in this session are not very common but awareness about various hazards is essential to be able to deal with them in case they occur.



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To reiterate, it is the role of the management to provide basic facilities like day care, canteen, rest room, recreational room, dispensary for first aid, etc., so that workers focus on their routine work in the factories, uninterrupted. Critical emergency essentials, such as alarms, evacuation plans, emergency lights and gathering areas, must be invested in. There are a lot of machinery used in the garment industry. However, before any work starts on a machinery, the worker should be trained in its proper operations and all safety precautions should be taken. Proper training and demonstration of work technique or process is valuable for each worker.

Some important suggestions for maintaining the health and safety of workers:

- (i) respiratory and hand protection
- (ii) eye protection
- (iii) heat stress protection
- (iv) supply of filtered drinking water
- (v) setup rest or sick rooms as per the number of workers
- (vi) set up recreation facility for the workers. In order to remove monotony from work, it is very essential to setup a recreation facility for the workers
- (vii) fire protection
- (viii) finger protection
- (ix) proper lighting
- (x) ergonomic design of the workstation
- (xi) awareness towards physical and psychological health
- (xii) first aid facility
- (xiii) adequate washrooms for the workers. Industries should provide proper sanitation system and sufficient number of toilets for the workers, based on their strength. By maintaining proper hygiene facilities, infections and other related diseases can be avoided
- (xiv) training programmes for health and safety issues. There is no alternative to training for any type of work. Training the worker to fit the job for which he has been employed is very significant

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- (xv) setting up of baby care centres for the worker. Many times, the garment and embroidery workers have to carry their small kids to the industries or their workplace, as there is nobody to look after these children at home and if they bring their kids along at workplace, there is a question of the health and security of children. So, factories should provide clean and hygienic day care centers so that workers can work efficiently without any stress

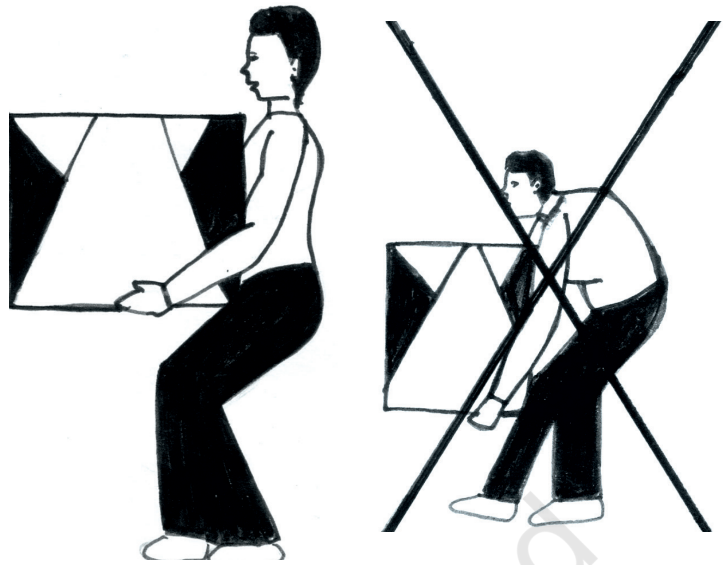


Fig. 5.2 Good lifting posture

- (xvi) ensuring proper posture while lifting goods, handling machines, and using personal protective equipment

Safety measures and precautions

Before using any tool or machine, the embroiderer should be trained in safe working practices. Their training should cover the following:

(a) Safety measures to prevent accidents with scissors

Hand scissors can cause accidents when not used properly. Scissor injuries usually happen when the scissor slips during cutting or trimming. In most cases, the blade cuts the worker's hand and/or fingers. Injuries can also occur to other parts of the body. The following safety measures should be taken:

- (i) Use suitable storage system, such as racks, boxes, etc., near the working area at a comfortable height to place scissors, blades, etc. after use.
- (ii) Ensure placing lighting fixtures in a way that the light should fall on the working surface from the left side or from the front. This promotes better visibility.
- (iii) Prohibit carrying knives in pockets, or in the hand when going from one place of work to another.

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- (iv) Do not hold scissors with sharp sides up or use when the middle screw is loose.
- (v) Fix disposal points for used blades.
- (vi) Use protective footwear with adequate resistance to slipping and penetration from a dropped knife or other sharp objects.
- (vii) Avoid leaving scissors around the work area. This can injure both the worker as well as others walking around.
- (viii) Provide even floor surfaces with slip resistance so the workers do not slip.
- (ix) Free the work surface and floor off debris and other waste to avoid tripping and falling.

(b) Safety measures to prevent accidents with needles

- (i) Keep needles and pins at a fixed place, such as in a special box, and all small parts from the embroiderer's set in separate bags. Do not leave them at the workplace.
- (ii) Do not hold the needle, pins, etc. in your mouth or tuck them in the clothes. Do not leave it in the fabric too. A worker can sew through his finger.

(c) Safety measures while using spray guns

Spray guns are used to get rid off any stains on the fabric that may have been transferred while embroidering. These guns use a cleaning fluid, such as ethylene which may cause headache, dizziness and fatigue if inhaled, or spirit which can cause redness, excessive dryness of the skin, if exposed.

Train the workers in the use of the gun. Spray the cleaning fluid onto a rag and then use the rag to clean, rather than spraying on the garment directly.

(d) Safety measures while ironing

- (i) Practise caution while using a hot iron as it can cause a major injury.
- (ii) Check for any faults with the cord before using it.
- (iii) Turn on and hold the plug with dry hands.

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- (iv) Place the iron only on a heat-resistant stand.
- (v) Ensure that the cord does not touch the iron soleplate while ironing.
- (vi) Select an ironing mode (heating temperature) suitable for the fabric to be ironed.

All essential chemicals used in the garment industry should be kept safely and workers must be trained to understand its usage, the proportion in which they are to be used, and repercussion of wrong use. Proper ventilation and protective tools are essential to protect workers during handling of chemicals.

Adequate lighting at every machine area can prevent eyestrain. Some garment manufacturing machines are very loud which can damage the hearing ability too. To protect the ear and hearing ability, ear plugs may be used.

In case of heat transfer, machines, boiler, pressing, fusing machines, where heat processes are used, it is important for workers to drink enough water during their work hours. Proper ventilation or the use of air turbine ventilators can also help to reduce temperatures and ensure comfort.

To avoid ergonomic injuries, workers must know how to take turns for different tasks or take regular short intervals to stretch and relax their muscles. The work area should have plenty of space for the task, should be clean, ventilated and should have correct working height, and proper sitting arrangement. Apart from that, industries provide soothing music at the workplace to keep the atmosphere light.

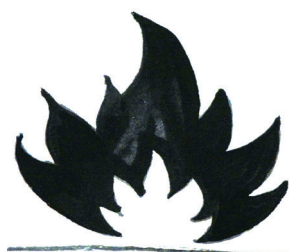
A signage or symbol is a picture, written word, sound or mark that represents a message. It is important to know the different types of symbols used in a workplace so that they can be followed. There are two types of symbols—safety symbols and navigation symbols. Safety symbols are those which are used for warning and the protection to be taken. Navigation symbols are used to show the direction or placement of a certain object or department. Some of the commonly used symbols are shown in Fig. 5.3.



Symbol for explosives or an explosion hazard



Sign to prohibit flames and smoking



Sign indicates flammable gas



Hazard symbol for nonflammable gas



Sign for protective eyewear



Sign for eye protection required



Symbol for gloves required



Sign for protective footwear



Sign for protective clothing



Sign for ear protection required



Sign for fire extinguisher



Sign for escape route



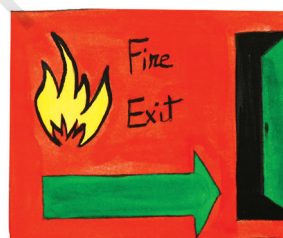
Symbol for first-aid



Hazard symbol for toxic



Hazard symbol for a corrosive substance



Symbol for fire exit



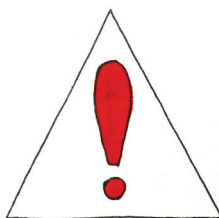
Hazard symbol for a harmful or irritant substance



Hazard symbol for flammable



Hazard symbol for oxidising



Warning sign



Symbol for no sitting



Sign for fire alarm

Fig. 5.3 Safety and navigation symbols

Policy measures

Following policy measures may clear the problems of work-related illness and diseases among the workers of the industry:

- (i) working system in two shifts
- (ii) proper execution of labour laws. There will be health insurance facilities
- (iii) supply of iron and vitamin tablets and medical camps should be arranged
- (iv) availability of amenities for staff and training for cleanliness
- (v) providing health facilities, like dispensary, doctor within the factory premises
- (vi) counselling and teaching for awareness about occupational hazards and
- (vii) fire fighting training on regular intervals.

Practical Exercises

Activity 1

Prepare a chart on the types of hazards.

Materials Required

1. Chart sheet of A3 size
2. Coloured pen or pencil
3. Eraser
4. Ruler
5. Glue
6. Scissors
7. Pictures of hazards

Procedure

1. Write down the types of hazards and collect appropriate pictures of hazards.
2. Paste the pictures on a chart sheet.
3. Decorate the sheet using coloured pen or pencil, and pin it on the drawing board of your classroom.

Activity 2

Prepare a chart of different types of symbols (safety and navigation).

Materials Required

1. Chart sheet of A3 size
2. Coloured pen or pencil



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3. Eraser
4. Ruler
5. Glue
6. Scissors
7. Relevant pictures

Procedure

1. Collect the pictures of symbols of safety and navigation.
2. Cut them neatly and appropriately.
3. Paste them properly on the chart sheet.
4. Decorate the chart sheet using coloured pen or pencil, and pin it on the drawing board of your classroom.

Check Your Progress

A. Fill in the blanks

1. Planning, training and _____ workshops are necessary to train employees and workers.
2. Excessive dust can cause chest infections, _____, flu etc.
3. RSI stands for _____.
4. Biohazards involve contagious bacteria, _____ and _____.
5. There are basically two types of symbols _____ and _____.

B. Questions

1. Explain different types of hazards in an embroidery unit.
2. Why is maintaining health and safety measures essential in a manufacturing unit?
3. Write at least three physical hazards that might be faced by an embroiderer and give causes and precautions to avoid them.

SESSION 2: CLEANING AND MAINTENANCE AT WORKPLACE

Cleaning and maintenance at a workplace is very important. It includes keeping the workplace, its structures, furniture, equipment, tools, machines, and facilities in good condition. The machinery should be in proper operating efficiency with proper safety measures.

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This includes performing many responsibilities, like repairing, replacing, servicing and inspecting. Maintenance should be done on a department or section-wise basis, for fast and accurate results. Regular maintenance staff is responsible for this maintenance work in the organisation. The term maintenance could also be used in relation to the importance of keeping the staff safe, fit and healthy, and working of the machines smooth and regularly.

Maintenance work can be classified into two types:

(a) Routine maintenance

This is usually planned in advanced. Regular interval maintenance procedures are very common in organisations. It includes scheduled inspections, repairs and replacement to make sure everything continues to work regularly, properly and smoothly. It is also preventive maintenance. It can be compared to an annual service of your four wheeler.

(b) Breakdown maintenance

This is the second type of maintenance. It is done as per the requirement of breakdown of any equipment or machinery. Corrective maintenance is needed when breakdowns occur which demands responsive action to be taken to get things right and running again. It can be compared to having a repair carried out on your four wheeler after the engine has failed.

Maintenance must be planned in advance as per the details given by the maintenance in- charge. An assessment of all the risks should be carried out and the staff should be involved in the process for creating awareness. The planning must chart the details and schedule of the maintenance required for each item. A record of all the procedures, changes and amendments made needs to be kept on a periodic basis.

Using appropriate equipment

The staff involved in the work of maintenance should have appropriate tools and equipment to repair the faults. It should also include appropriate protective equipment in case of accidents or emergency. Many

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times accidents can be avoided by avoiding 'to make do' with an inappropriate tool or piece of equipment.

Making areas safe

In any industry, keeping the workplace safe is of prime importance. It may even be sometimes needed to restrict access to the equipment and the area being maintained. Clear warning cards or instructions can be attached to the machinery to remind the workers of the care that needs to be taken while handling it.

Elements of an effective cleaning programme

Dust and dirt removal

In some embroidery units, exhaust ventilation systems may not work to collect dust, dirt and chips properly. Vacuum cleaners are the most appropriate equipment to remove dust and dirt. Industrial procedures have special methods for cleaning walls, ceilings, ledges, machinery, and other places where dust and dirt may accumulate.

Dampening floors or using sweeping compounds before sweeping reduces the airborne dust. The dust that gets collected in places, like shelves, piping, conduits, light fixtures, reflectors, windows, cupboards and lockers may require regular manual cleaning.

Special-purpose vacuum machines are very useful for removing the hazardous substances. For example, vacuum cleaners fitted with High Efficiency Particulate Air (HEPA) filters are used to remove fine particles of fibreglass or asbestos.

The facilities need to be adequate, clean and well maintained. Lockers are essential for storing the employee's personal belongings. Washrooms need to be cleaned daily. They also need to have good and regular supply of clean water, soap, towels and disinfectants.

If the staff is using hazardous materials, they should be provided special facilities, such as showers, washing facilities and changing rooms. The staff should be instructed to keep the clothes of their workplace, separate from the clothes of home.

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Smoking, eating or drinking alcohol in the work area should be prohibited where toxic materials are handled. The eating area should be separate from the workplace and should be cleaned regularly and properly in each shift.

Surfaces

Floors

It should be cleaned regularly. Poor condition of the floor is a major cause of accidents; so cleaning up the oily substance and other liquids is important. Chips and dust accumulation can also cause accidents. Areas that cannot be cleaned regularly and continuously, such as the entrance and common corridors, should have anti-slip flooring.

Walls

Light-coloured walls reflect the light and create an illusion of wide and broad spaces while dirty or dark-coloured walls absorb the light. Contrasting colours help warn of physical hazards and mark obstructions. Pillars, railings, and other safety equipment can thus, be highlighted with the use of paints. A schedule should be prepared, with the regulations and standards of using various colours in a workplace.

Aisles and stairways

Corridors and aisles must be wide enough to accommodate the staff and vehicles, comfortably without causing a crowd or a rush. Aisle space allows for the movement of people, products and materials. Warning signs and mirrors should be placed as they can improve sight lines in blind corners. Arranging aisles systematically and conveniently so that it encourages people to use them, instead of following shortcuts through hazardous places. Keeping aisles and stairways clear is very important.

Maintain light fixtures

Dirty light fixtures reduce the required light levels. It is important to clean the lights regularly as clean light fixtures can improve lighting efficiency significantly.

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Spill control

The best way to control spills is to prevent them. Regular cleaning and maintaining the machines and equipment is one way. The other way is to use drip pans and guards wherever there is a possibility of spillage. When spills occur, it is essential to clean them up immediately. To wipe away greasy, oily and other liquid spills, absorbent materials are very useful. These used absorbents must be disposed off properly at the right place, and safely.

Tools and equipment

Tools require suitable fixtures with marked locations to provide proper arrangement, both in the tool room and near the workplace. They should be kept at the designated place immediately after use so the chances of being misplaced or lost are reduced. The person in charge should regularly inspect the cleanliness and repair of all tools.

Maintenance

A regular checking of the condition of building, its infrastructure and equipment may be the most important aspect for the maintenance of an embroidery unit. Keeping these safe, in an efficient working order and a good, repaired condition, is also included in the maintenance work. This includes maintaining sanitary facilities and regular painting and cleaning of walls. It is important to replace or fix broken or damaged items as early as possible. A good maintenance programme includes inspection, the repair of tools, equipment, machines and processes.

Waste disposal

Regular collection and sorting of waste contribute to good housekeeping practices. It makes easier to separate materials that can be recycled from those going to waste disposal. Putting scrap containers near the places where waste is produced encourages orderly waste disposal and makes collection easier. All waste collecting bins should be clearly labelled as recyclable glass, plastic, scrap metal, etc.

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Storage

Large and categorised storage areas for stock, wastage and recyclable material is a structured and a progressive method of organising production. Stored materials must be out of the way of the frequently visited sites and exits, fire equipment, aisles, emergency showers, stairs or first aid stations. All storage areas should be clearly marked.

Flammable, combustible, toxic and other hazardous materials should be stored in approved containers in designated areas. Storage of materials should meet all requirements specified in the fire codes and the regulations of environmental and occupational health and safety agencies in the jurisdiction.

Benefits of a clean environment

Proper cleaning in an organisation has a positive effect on the employees. Some of the benefits of keeping a clean environment in an organisation are as follows:

- (i) Healthy employees may mean fewer sick days.
- (ii) Cleanliness creates satisfaction.
- (iii) It preserves assets over the long term.
- (iv) It maintains a good image of the organisation.

Practical Exercise

Activity 1

Role Play (Importance of cleanliness at the workplace)

Requirements

- 1. Students, to perform the role play
- 2. Some other students around
- 3. Teacher
- 4. Classroom essentials, like tables, chairs, books, pen, embroidery frame, needle, some other embroidery material, lunch boxes

Procedure

- 1. The teacher introduces the importance of cleanliness at the workplace and introduces the topic of role play (like embroiderer working on frame after lunch without washing hands and the fabric getting stained)

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2. Students will play the role of embroiderer and supervisor, and an argument takes place between them.
3. The teacher will explain the importance of maintaining cleanliness at the workplace.
4. Finally, a conclusion is generated after discussion with students.

Check Your Progress

A. Fill in the blanks

1. Proper _____ in an organisation has a positive effect on the employees and creates a good image of the organisation.
2. The two main types of maintenance work are _____ and _____.
3. An organisation having proper _____ materials for overcoming material storage problems is surely a beneficial organisation.

B. Questions

1. Explain the importance of storage at an embroidery unit.
2. Using the awareness from the above Unit, write the type of maintenance that would be needed for an embroidery unit.
3. Discuss the cleanliness that is required for an embroidery unit.

